

SEQUENCE LISTING

- <110> Chano, Tokuhiro Okabe, Hidetoshi Ikegawa, Shiro
- <120> RB1 gene induced protein (RB1CC1) and gene

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- <130> 3190-070
- <140> US 10/516,558
- <141> 2004-11-30
- <150> PCT/JP03/00882
- <151> 2003-01-30
- <150> JP P2002-161400
- <151> 2002-06-03
- <150> JP P2002-214978
- <151> 2002-07-24
- <160> 132
- <170> PatentIn version 3.1
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- Gln Ser Lys Tyr Lys Ile Ala Ile Gln His Gln Val Leu Val Val Asn 35 40 45
- Gly Glu Cys Met Ala Ala Asp Arg Arg Val Cys Thr Tyr Ser Ala 50 60
- Gly Thr Asp Thr Asn Pro Ile Phe Leu Phe Asn Lys Glu Met Ile Leu 65 70 75 80

Cys Asp Arg Pro Pro Ala Ile Pro Lys Thr Thr Phe Ser Thr Glu Asn 85 90 95

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Asp Met Glu Ile Lys Val Glu Glu Ser Leu Met Met Pro Ala Val Phe 100 105 110

His Thr Val Ala Ser Arg Thr Gln Leu Ala Leu Glu Met Tyr Glu Val 115 120 125

Ala Lys Lys Leu Cys Ser Phe Cys Glu Gly Leu Val His Asp Glu His 130 135 140

Leu Gln His Gln Gly Trp Ala Ala Ile Met Ala Asn Leu Glu Asp Cys 145 150 155 160

Ser Asn Ser Tyr Gln Lys Leu Leu Phe Lys Phe Glu Ser Ile Tyr Ser 165 170 175

Asn Tyr Leu Gln Ser Ile Glu Asp Ile Lys Leu Lys Leu Thr His Leu 180 185 190

Gly Thr Ala Val Ser Val Met Ala Lys Ile Pro Leu Leu Glu Cys Leu 195 200 205

Thr Arg His Ser Tyr Arg Glu Cys Leu Gly Arg Leu Asp Ser Leu Pro 210 215 220

Glu His Glu Asp Ser Glu Lys Ala Glu Thr Lys Arg Ser Thr Glu Leu 225 . 230 235 240

Val Leu Ser Pro Asp Met Pro Arg Thr Thr Asn Glu Ser Leu Leu Thr 245 250 255

Ser Phe Pro Lys Ser Val Glu His Val Ser Pro Asp Thr Ala Asp Ala 260 265 270

Glu Ser Gly Lys Glu Ile Arg Glu Ser Cys Gln Ser Thr Val His Gln 275 280 285

Gln Asp Glu Thr Thr Ile Asp Thr Lys Asp Gly Asp Leu Pro Phe Phe 290 295 300

Asn Val Ser Leu Leu Asp Trp Ile Asn Val Gln Asp Arg Pro Asn Asp 305 310 315 320

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Val Glu Ser Leu Val Arg Lys Cys Phe Asp Ser Met Ser Arg Leu Asp 325 330 335

Pro Arg Ile Ile Arg Pro Phe Ile Ala Glu Cys Arg Gln Thr Ile Ala 340 345 350

Lys Leu Asp Asn Gln Asn Met Lys Ala Ile Lys Gly Leu Glu Asp Arg 355 360 365

Leu Tyr Ala Leu Asp Gln Met Ile Ala Ser Cys Gly Arg Leu Val Asn 370 380

Glu Gln Lys Glu Leu Ala Gln Gly Phe Leu Ala Asn Gln Lys Arg Ala 385 390 395 400

Glu Asn Leu Lys Asp Ala Ser Val Leu Pro Asp Leu Cys Leu Ser His
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His Val Arg Leu Lys Trp Cys Cys Phe Val Met Leu His Ala Asp Gln 450 455 460

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Glu Arg Val Lys Ile Val Glu Ala Leu Ser Thr Val Pro Gln Met Tyr 485 490 495

Cys Leu Ala Val Val Glu Val Val Arg Arg Lys Met Phe Ile Lys His 500 505 510

Tyr Arg Glu Trp Ala Gly Ala Leu Val Lys Asp Gly Lys Arg Leu Tyr 515 520 525

Glu Ala Glu Lys Ser Lys Arg Glu Ser Phe Gly Lys Leu Phe Arg Lys 530 540

Ser Phe Leu Arg Asn Arg Leu Phe Arg Gly Leu Asp Ser Trp Pro Pro 545 550 555 560

Ser Phe Cys Thr Gln Lys Pro Arg Lys Phe Asp Cys Glu Leu Pro Asp 565 570 575

Ile Ser Leu Lys Asp Leu Gln Phe Leu Gln Ser Phe Cys Pro Ser Glu 580 585 590

Val Gln Pro Phe Leu Arg Val Pro Leu Leu Cys Asp Phe Glu Pro Leu 595 600 605

His Gln His Val Leu Ala Leu His Asn Leu Val Lys Ala Ala Gln Ser 610 620

Leu Asp Glu Met Ser Gln Thr Ile Thr Asp Leu Leu Ser Glu Gln Lys 625 630 635 640

Ala Ser Val Ser Gln Thr Ser Pro Gln Ser Ala Ser Ser Pro Arg Met 645 650 655

Glu Ser Thr Ala Gly Ile Thr Thr Thr Thr Ser Pro Arg Thr Pro Pro 660 665 670

Pro Leu Thr Val Gln Asp Pro Leu Cys Pro Ala Val Cys Pro Leu Glu 675 680 685

Glu Leu Ser Pro Asp Ser Ile Asp Ala His Thr Phe Asp Phe Glu Thr 690 695 700

Ile Pro His Pro Asn Ile Glu Gln Thr Ile His Gln Val Ser Leu Asp 705 710 715 720

Leu Asp Ser Leu Ala Glu Ser Pro Glu Ser Asp Phe Met Ser Ala Val725 730 735

Asn Glu Phe Val Ile Glu Glu Asn Leu Ser Ser Pro Asn Pro Ile Ser 740 745 750

Asp Pro Gln Ser Pro Glu Met Met Val Glu Ser Leu Tyr Ser Ser Val Ile Asn Ala Ile Asp Ser Arg Arg Met Gln Asp Thr Asn Val Cys Gly Lys Glu Asp Phe Gly Asp His Thr Ser Leu Asn Val Gln Leu Glu Arg Cys Arg Val Val Ala Gln Asp Ser His Phe Ser Ile Gln Thr Ile Lys Glu Asp Leu Cys His Phe Arg Thr Phe Val Gln Lys Glu Gln Cys Asp Phe Ser Asn Ser Leu Lys Cys Thr Ala Val Glu Ile Arg Asn Ile Ile Glu Lys Val Lys Cys Ser Leu Glu Ile Thr Leu Lys Glu Lys His Gln Lys Glu Leu Leu Ser Leu Lys Asn Glu Tyr Glu Gly Lys Leu Asp Gly Leu Ile Lys Glu Thr Glu Glu Asn Glu Asn Lys Ile Lys Lys Leu Lys Gly Glu Leu Val Cys Leu Glu Glu Val Leu Gln Asn Lys Asp Asn Glu Phe Ala Leu Val Lys His Glu Lys Glu Ala Val Ile Cys Leu Gln Asn Glu Lys Asp Gln Lys Leu Leu Glu Met Glu Asn Ile Met His Ser Gln

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Asp Leu Lys Lys Leu His Val Glu Asn Asp Glu Lys Leu Gln Leu Leu 965 970 975

Asn Cys Glu Ile Lys Glu Leu Lys Gln Ser Arg Glu Ile Val Leu Glu

- Arg Ala Glu Leu Gln Ser Leu Glu Gln Ser His Leu Lys Glu Leu Glu 980 985 990
- Asp Thr Leu Gln Val Arg His Ile Gln Glu Phe Glu Lys Val Met Thr 995 1000 1005
- Asp His $\mbox{Arg Val Ser Leu Glu Glu Leu Lys Lys Glu}$ Asn $\mbox{Gln Gln }$ 1010 $\mbox{100}$
- Ile Ile Asn Gln Ile Gln Glu Ser His Ala Glu Ile Ile Gln Glu 1025 1030 1035
- Lys Glu Lys Gln Leu Gln Glu Leu Lys Leu Lys Val Ser Asp Leu 1040 1045 1050
- Ser Asp Thr Arg Cys Lys Leu Glu Val Glu Leu Ala Leu Lys Glu 1055 1060 1065
- Ala Glu Thr Asp Glu Ile Lys Ile Leu Leu Glu Glu Ser Arg Ala 1070 1075 1080
- Gln Gln Lys Glu Thr Leu Lys Ser Leu Leu Glu Gln Glu Thr Glu 1085 1090 1095
- Asn Leu Arg Thr Glu Ile Ser Lys Leu Asn Gln Lys Ile Gln Asp 1100 1105 1110
- Asn Asn Glu Asn Tyr Gln Val Gly Leu Ala Glu Leu Arg Thr Leu 1115 1120 1125
- Met Thr Ile Glu Lys Asp Gln Arg Ile Ser Glu Leu Ile Ser Arg 1130 1135 1140
- His Glu Glu Glu Ser Asn Ile Leu Lys Ala Glu Leu Asn Lys Val 1145 1150 1155
- Thr Ser Leu His Asn Gln Ala Phe Glu Ile Glu Lys Asn Leu Lys 1160 1165 1170
- Glu Gln Ile Ile Glu Leu Gln Ser Lys Leu Asp Ser Glu Leu Ser 1175 1180 1185

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Lys Leu Glu Glu Glu Val Ser Lys Leu Arg Ser Ser Ser Phe Val

Pro Ser Pro Tyr Val Ala Thr Ala Pro Glu Leu Tyr Gly Ala Cys 1400 1405 1410

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Ala Pro Glu Leu Pro Gly Glu Ser Asp Arg Ser Ala Val Glu Thr 1415 1420 1425

Ala Asp Glu Gly Arg Val Asp Ser Ala Met Glu Thr Ser Met Met 1430 1435 1440

Ile Met Leu Glu Arg Thr Leu Gln Leu Lys Glu Glu Asn 1460 1465 1470

Lys Arg Leu Asn Gln Arg Leu Met Ser Gln Ser Met Ser Ser Val 1475 1480 1485

Ser Ser Arg His Ser Glu Lys Ile Ala Ile Arg Asp Phe Gln Val 1490 1495 1500

Gly Asp Leu Val Leu Ile Ile Leu Asp Glu Arg His Asp Asn Tyr 1505 1510 1515

Val Leu Phe Thr Val Ser Pro Thr Leu Tyr Phe Leu His Ser Glu 1520 1530

Ser Leu Pro Ala Leu Asp Leu Lys Pro Gly Glu Gly Ala Ser Gly 1535 1540 1545

Ala Ser Arg Arg Pro Trp Val Leu Gly Lys Val Met Glu Lys Glu 1550 1560

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Gln Ser Lys Tyr Lys Ile Ala Ile Gln His Gln Val Leu Val Val Asn 35 40 45

Gly Glu Cys Met Ala Ala Asp Arg Arg Val Cys Thr Tyr Ser Ala 50 60

Gly Thr Asp Thr Asn Pro Ile Phe Leu Phe Asn Lys Glu Met Ile Leu 65 70 75 80

Cys Asp Arg Ala Pro Ala Ile Pro Lys Ala Thr Phe Ser Thr Glu Asn 85 90 95

Asp Met Glu Ile Lys Val Glu Glu Ser Leu Met Met Pro Ala Val Phe 100 105 110

His Thr Val Ala Ser Arg Thr Gln Leu Ala Val Glu Met Tyr Asp Val 115 120 125

Ala Lys Lys Leu Cys Ser Phe Cys Glu Gly Leu Val His Asp Glu His 130 135 140

Leu Gln His Gln Gly Trp Ala Ala Ile Met Ala Asn Leu Glu Asp Cys 145 150 155 160

Ser Asn Ser Tyr Gln Lys Leu Leu Phe Lys Phe Glu Ser Ile Tyr Ser 165 170 175

Asp Tyr Leu Gln Ser Ile Glu Asp Ile Lys Leu Lys Leu Thr His Leu 180 185 190

Gly Thr Ala Val Ser Val Met Ala Lys Ile Pro Leu Leu Glu Cys Leu Thr Arg His Ser Tyr Arg Glu Cys Leu Gly Arg Pro Asp Ser Leu Asn Glu His Glu Gly Ser Glu Lys Ala Glu Met Lys Arg Ser Thr Glu Leu Val Leu Ser Pro Asp Met Pro Arg Thr Thr Asn Thr Ser Leu Val Thr Ser Phe His Lys Ser Met Glu His Val Ala Pro Asp Pro Thr Gly Thr Glu Arg Gly Lys Glu Leu Arg Glu Ser Cys Gln Ser Thr Val Gln Gln Glu Glu Ala Ser Val Asp Ala Lys Asp Ser Asp Leu Pro Phe Phe Asn Val Ser Leu Leu Asp Trp Ile Asn Val Gln Asp Arg Pro Asn Asp Val Glu Ser Leu Val Arg Lys Cys Phe Asp Ser Met Ser Arg Leu Asp Pro Lys Ile Ile Gln Pro Phe Met Leu Glu Cys His Gln Thr Ile Ala Lys Leu Asp Asn Gln Asn Met Lys Ala Ile Lys Gly Leu Glu Asp Arg Leu Tyr Ala Leu Asp Gln Met Ile Ala Ser Cys Ser Arg Leu Val Asn Glu Gln Lys Glu Leu Ala Gln Gly Phe Leu Ala Asn Gln Met Arg Ala Glu Asn Leu Lys Asp Ala Ser Val Leu Pro Asp Leu Cys Leu Ser His Ala

Asn Gln Leu Met Ile Met Leu Gln Asn His Arg Lys Leu Leu Asp Ile Lys Gln Lys Cys Thr Thr Ala Lys Gln Glu Leu Ala Asn Asn Leu His Val Arg Leu Lys Trp Cys Cys Phe Val Met Leu His Ala Asp Gln Asp Gly Glu Lys Leu Gln Ala Leu Leu Arg Leu Val Ile Glu Leu Leu Glu Arg Val Arg Ile Val Glu Ala Leu Ser Thr Val Pro Gln Met Tyr Cys Leu Ala Val Val Glu Val Val Arg Arg Lys Met Phe Ile Lys His Tyr Arg Glu Trp Ala Gly Ala Leu Val Lys Asp Gly Lys Gln Leu Tyr Glu Ala Glu Lys Ser Lys Arg Glu Ser Phe Gly Lys Leu Phe Arg Lys Ser Phe Leu Arg Asn Arg Leu Phe Lys Gly Leu Asp Ser Trp Pro Ser Ser Phe Cys Thr Gln Lys Pro Arg Lys Phe Asp Cys Glu Leu Pro Asp Ile Ser Leu Lys Asp Leu Gln Phe Leu Gln Ser Phe Cys Pro Ser Glu Val Gln Pro Phe Leu Arg Val Pro Leu Leu Cys Asp Phe Glu Pro Leu His Gln His Val Leu Ala Leu His Asn Leu Val Lys Ala Ala Gln Ser Leu Asp Glu Met Ser Gln Thr Ile Thr Asp Leu Leu Asn Glu Gln Lys Val

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Ser Thr Ser Gln Ala Ser Pro Gln Ser Ala Ala Ser Pro Arg Ile Glu $645 \hspace{1cm} 650 \hspace{1cm} 655$

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Ser Thr Thr Gly Ile Thr Thr Thr Thr Ser Pro Lys Thr Pro Pro 660 665 670

Leu Thr Val Gln Asp Thr Leu Cys Pro Ala Val Cys Pro Leu Glu Glu 675 680 685

Leu Ser Pro Asp Ser Ile Asp Ala His Thr Phe Asp Phe Glu Thr Ile 690 695 700

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Ser His Pro Asn Thr Glu Gln Pro Val His Gln Ala Ser Ile Asp Leu 705 710 715 720

Asp Ser Leu Ala Glu Ser Pro Glu Ser Asp Phe Met Ser Ala Val Asn 725 730 735

Glu Phe Val Ile Glu Glu Asn Leu Ser Ser Pro Asn Pro Ile Ser Asp 740 745 750

Pro Gln Ser Pro Glu Met Met Val Glu Ser Leu Tyr Ser Ser Val Ile 755 760 765

Asn Ala Ile Asp Ser Arg Arg Met Gln Asp Thr Ser Thr Arg Gly Asn 770 775 780

Glu Gly Phe Gly Asp Arg Ala Ala Leu His Val Gln Leu Glu Lys Cys 785 790 795 800

Arg Ala Ala Gln Asp Ser His Thr Ser Ile Gln Thr Ile Lys Asp 805 810 815

Asp Leu Cys His Phe Arg Thr Phe Val Gln Lys Glu Gln Cys Asp Leu 820 825 830

Ala Asn Tyr Leu Lys Cys Thr Ala Val Glu Ile Arg Asn Ile Ile Glu 835 840 845

Lys Val Lys Cys Ser Leu Glu Ile Thr Leu Lys Glu Lys His Gln Gln 850 860

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Asn Leu Val Ser Leu Glu Glu Ala Leu Gln Asn Lys Asp Asn Glu Phe 900 905 910

Thr Ser Ile Lys His Glu Lys Asp Ala Ile Val Cys Val Gln Glu 915 920 925

Lys Asp Gln Lys Leu Leu Glu Met Glu Lys Ile Met His Thr Gln His 930 935 940

Cys Glu Ile Lys Glu Leu Lys Gln Ser Arg Glu Met Ala Leu Glu Asp 945 950 955 960

Leu Lys Lys Leu His Asp Glu Lys Ile Glu Ser Leu Arg Ala Glu Phe 965 970 975

Gln Cys Leu Glu Glu Asn His Leu Lys Glu Leu Glu Asp Thr Leu His 980 985 990

Ile Arg His Thr Gln Glu Phe Glu Lys Val Met Thr Asp His Asn Met 995 1000 1005

Ser Leu Glu Lys Leu Lys Lys Glu Asn Gln Gln Arg Ile Asp Gln 1010 1015 1020

Met Leu Glu Ser His Ala Ser Thr Ile Gln Glu Lys Glu Gln Gln 1025 1030 1035

Leu Gln Glu Leu Lys Leu Lys Val Ser Asp Leu Ser Asp Met Arg
1040 1045 1050

Cys Lys Leu Glu Val Glu Leu Ala Leu Lys Glu Ala Glu Thr Asp 1055 1060 1065

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Glu Ile Ser Lys Leu Asn Gln Lys Ile His Asp Asn Asn Glu Ser 1100 1105 1110

Tyr Gln Val Gly Leu Ser Glu Leu Arg Ala Leu Met Thr Ile Glu 1115 1120 1125

Lys Asp Gln Cys Ile Ser Glu Leu Ile Ser Arg His Glu Glu Glu 1130 1135 1140

Ser Asn Ile Leu Lys Ala Glu Leu Asp Asn Val Thr Ser Leu His 1145 1150 1155

Arg Gln Ala Tyr Glu Ile Glu Lys Lys Leu Lys Glu Gln Ile Val 1160 1165 1170

Glu Leu Gln Thr Arg Leu Asn Ser Glu Leu Ser Ala Leu Glu Lys 1175 1180 1185

Gln Lys Asp Glu Lys Ile Thr Gln Gln Glu Glu Lys Tyr Glu Ala 1190 1195 1200

Leu Ile Gln Asn Leu Glu Lys Asp Lys Glu Arg Leu Val Lys Asn 1205 1210 1215

His Glu Gln Asp Lys Glu His Leu Ile Gln Glu Leu Asn Phe Glu 1220 1225 1230

Lys Asn Lys Ala Val Gln Thr Ala Leu Asp Glu Phe Lys Val Glu 1235 1240 1245

Arg Glu Leu Val Glu Lys Glu Leu Leu Glu Lys Val Lys His Leu 1250 1260

Glu Asn Gln Ile Ala Lys Thr Pro Ala Phe Glu Ser Ala Arg Glu 1265 1270 1275

Asp Ser Ser Ser Leu Val Ala Glu Leu Gln Glu Lys Leu Gln Glu 1280 1285 1290 Glu Lys Ala Lys Phe Leu Glu Gln Leu Glu Glu Gln Glu Lys Arg 1295 1300 1305

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- Lys Glu Asn Ile Ile Asn Asp Leu Ser Asp Lys Leu Lys Ser Thr 1340 1345 1350
- Met Gln Gln Glu Arg Asp Lys Asp Leu Ile Glu Ser Leu Ser 1355 1360 1365
- Glu Asp Arg Ala Arg Leu Leu Glu Glu Lys Lys Gln Leu Glu Glu 1370 1380
- Glu Val Ser Lys Leu Arg Thr Ser Ser Phe Leu Ser Ser Ala Pro 1385 1390 1395
- Val Ala Ala Pro Glu Leu Tyr Gly Ala Cys Ala Pro Glu Leu 1400 1405 1410
- Pro Gly Glu Pro Glu Arg Ser Val Met Glu Thr Ala Asp Glu Gly 1415 1420 1425
- Arg Leu Asp Ser Ala Met Glu Thr Ser Met Met Ser Val Gln Glu 1430 1435 1440
- Asn Met Leu Ser Glu Glu Lys Gln Arg Ile Met Leu Leu Glu Arg 1445 1450 1455
- Thr Leu Gln Leu Lys Glu Glu Glu Asn Lys Arg Leu Asn Gln Arg 1460 1465 1470
- Leu Met Ser Gln Ser Leu Ser Ser Val Ser Ser Arg His Ser Glu 1475 1480 1485
- Lys Ile Ala Ile Arg Asp Phe Gln Val Gly Asp Leu Val Leu Ile 1490 1495 1500

Ile Leu Asp Glu Arg His Asp Asn Tyr Val Leu Phe Thr Val Ser 1505 1510 1515 Pro Thr Leu Tyr Phe Leu His Ser Glu Ser Leu Pro Ala Leu Asp 1520 1525 1530 Leu Lys Pro Gly Glu Gly Ala Ser Gly Ala Ser Arg Pro Trp 1535 1540 Val Leu Gly Lys Val Met Glu Lys Glu Tyr Cys Gln Ala Lys Lys 1550 1555 1560 Ala Gln Asn Arg Phe Lys Val Pro Leu Gly Thr Lys Phe Tyr Arg Val Lys Ala Val Ser Trp Asn Lys Lys Val 1580 1585 <210> <211> 6636 <212> DNA <213> Unknown <220> <223> human RB1CC1 gene <400> 3 gtcgacaata acaaaccaag ccgcggcggt gtccgcggcc ctgccgagcc ctcqgcgttq 60 ceteagaate ecceagtege etgggeeest eggetetgae aggeegegge ettetgteee 120 coggecoag accoagagee gaggggeetg etegegteet tgteegeeeg gaeceeteee 180 tgcctcctag agttcggggc cgcgggggc gggcgcccgg gacgccggcg gttgtgtcgg 240 cttagcggtg ccgaatgggc ggttggtaac cgctgccgag gactaggcgg cggcggaaga 300 tggtgccggg ggtcgctggc tctgctgctg ccgccggcga aggaggaggc gttgccggtt 360 420 agttttaatc tactttttaa gaaaagtggt agtccttttc acagtgcctg acgtaactgt 480 atcagagggt gaggtataag ctcacagaat tcagataaat catcatgaag ttatatgtat 540 ttctggttaa cactggaact actctaacat ttgacactga acttacagtg caaactgtgg 600 cagacettaa gcatgecatt caaagcaaat acaagattge tattcaacac caggtgetgg 660 tggtcaatgg aggagaatgc atggctgcag atcgaagagt gtgtacctac agtgctggga

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